

Characteristic equation is:

* *Rearrange the components…*

*Use the stability judgement criteria. In this case Jury’s test*

*2024.04.08*

The reason why we would like to use July stability test instead of Routh Hurwitz is explained at the introduction.

Watching <https://www.youtube.com/watch?v=NRbGPgcLhU0&list=PLUMWjy5jgHK0MLv6Ksf-NHi7Ur8NRNU4Z&index=6&ab_channel=BrianDouglas>

**Discrete control #6: z-plane warping and the bilinear transform**

Giao trinh dieu khien so. Digital control system in Vietnamese

[*https://www.slideshare.net/man2017/gio-trnh-iu-khin-spdf*](https://www.slideshare.net/man2017/gio-trnh-iu-khin-spdf)

[*https://www.youtube.com/watch?v=88tWmyBaKIQ&list=PLUMWjy5jgHK0MLv6Ksf-NHi7Ur8NRNU4Z&index=5&ab\_channel=BrianDouglas*](https://www.youtube.com/watch?v=88tWmyBaKIQ&list=PLUMWjy5jgHK0MLv6Ksf-NHi7Ur8NRNU4Z&index=5&ab_channel=BrianDouglas)

*The derivation of the bilinear transform to convert from s domain to z domain.*

*Digital control system in Vietnamese by HUST.*

[*https://www.youtube.com/watch?v=OJHVl6Mykxk&list=PLpq\_FLpqGnQKkP\_uB32X7jB2HNtZntuD1&index=3&ab\_channel=ph%C6%B0%C6%A1ngnamnguy%E1%BB%85n*](https://www.youtube.com/watch?v=OJHVl6Mykxk&list=PLpq_FLpqGnQKkP_uB32X7jB2HNtZntuD1&index=3&ab_channel=ph%C6%B0%C6%A1ngnamnguy%E1%BB%85n)

Another course with describe those idea in math forms nicely.

[*https://www.youtube.com/watch?v=nWb52PkYHDI*](https://www.youtube.com/watch?v=nWb52PkYHDI)

Let’s recap what I understood so far:

* Z transform definition
* Why z transform is necessary and where it’s used. -> digital computer
* How to derive the relationship between s and z transform using math. -> Tustin method
* Stability in the z domain. Definition and how to test it.

It’s not only for control engineering but for signal and system in general. It’s great to truly understand how they generalize the control problem and filtering problem and view them as the same math problem.

Next steps:

ROC

Review and do exercise… maybe from Youtube.